

#### ABSTRACT OF THE DISCLOSURE

A compressor includes a vaneless diffuser, a volute in fluid communication with the diffuser, and an impeller operable to compress a fluid stream and direct the fluid stream to the diffuser. The impeller includes a hub having an axis of rotation and a plurality of blades extending therefrom. The blades include a surface defined by an axial direction (Z), a radius (R) defined from the axis of rotation of the hub, and a polar angle ( $\Theta$ ), whereby  $\Theta$  is substantially defined by the equation:  $\Theta = a * [\text{natural logarithm of (R)}] + b$ .